TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE 12M)

EBC 2306: CONSTRUCTION PLANT & EQUIPMENT

END OF SEMESTER EXAMINATION
SERIES: AUGUST 2014
TIME ALLOWED: 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
-   *Answer Booklet*
This paper consists of **FIVE** questions. Answer any **THREE** questions
All questions carry equal marks
Maximum marks for each part of a question are as shown
Use neat, large and well labeled diagrams where required

This paper consists of **THREE** printed pages

Question

a) State FIVE reasons why plant site output may vary from rated output. **(5 marks)**

b) Calculate the cost of owning and operating a bull dozer given the following data.

- Purchase price - 24.5 million
- Resale value - 6.2 million
- Useful life - 5 years
- Average annual repairs and maintenance - 780,000
- Taxes and insurance - 4% of depreciation
- Diesel - Consumes 12 litres per a hour day @ 90/- per litre
- Operator - Wages – 12,000/= per week
- Lubricating oil - 5 liters per week @ 150/= per litre
- Banks men - 2No @ 500/= per day
- Tyres - 3 sets @ 480,000/-
- Cutting edges - 2 sets @ 90,000/=
- Overheads and profits - 25% **(15 marks)**

Question Two

With the aid of a sketch, explain the working cycle of a self propelled mobile crane. **(20 marks)**

Question Three

a) Explain THREE advantages and THREE disadvantages of the following methods of acquiring plant.
   (i) Hiring
   (ii) Purchasing (owning)
   (iii) Hire purchase **(9 marks)**

b) State FIVE factors to be considered when selecting equipment for any particular job **(5 marks)**

c) Briefly explain SIX essential components of the central mixing plant **(6 marks)**

Question Four

a) With the aid of a sketch, outline the working cycle of a drag line **(10 marks)**

b) How many $3.0m^3$ highway dumpers are required to service a mechanical shovel at maximum efficiency given the following data:
- Plant output – $8m^3$/hr
- Loaded speed – 25km/hr
- Empty speed – 40km/hr
- Manouring at each end = 0.5min
- Distance to be tracked – 50km one way
  (Assume any other information) **(10 marks)**

Question Five

a) State FIVE reasons for maintaining construction plant.   **(5 marks)**

b) Outline FIVE operation carried out by the dragline   **(5 marks)**

c) State FOUR factors that affect choice of transporting plant.   **(4 marks)**

d) State THREE advantages and THREE disadvantages of small trucks over large ones.   **(6 marks)**